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# EMPOWERING SCIENCE: STRATEGIES TO MAXIMIZE VISIBILITY AND PRODUCTIVITY IN PRIVATE UNIVERSITIES

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## Summary

*The visibility of scientific production is a determining factor for the positioning and recognition of private universities in the global academic field. This article proposes a management model that integrates productivity and visibility strategies, optimizing the dissemination of knowledge and institutional consolidation in international rankings. Based on the results of empirical tests from the database archive of researchers and *perfiles.xls*, key recommendations are presented to improve the impact and scope of scientific production in private universities.*

**KEYWORDS:** Scientific Visibility, Academic Productivity, University Management, Internationalization, University Rankings.

## 1. INTRODUCTION

In a context of globalization of knowledge, the visibility of scientific production has become a priority for private universities seeking to consolidate their presence in the international academic ecosystem. Unlike public universities, these institutions face specific challenges in terms of funding, infrastructure, and internationalization strategies. However, through efficient management and the use of innovative tools, it is possible to enhance the productivity and impact of academic research.

In the last decade, the visibility of scientific production has become a key indicator of the performance and academic quality of private universities. An institution's ability to disseminate and position its scholarly output in databases, collaborative networks, and digital media is essential to its recognition and prestige in the global scientific community. According to Valdés Pérez (2020), greater visibility not only increases institutional recognition, but also facilitates the attraction of talent and the generation of strategic collaborations.

Scientific productivity, measured through the number of indexed publications, citations received and participation in research projects, is essential for the positioning of universities in international rankings. However, productivity alone does not guarantee an overall impact; It is necessary for universities to implement management strategies to increase their reach and relevance in the international academic community. Recent studies have shown that an efficient management of scientific visibility requires the integration of institutional open access policies, alliances with global research centers and the optimization of bibliometric tools to evaluate the impact of scientific production.

Despite these advances, private universities face specific challenges in terms of financing, infrastructure, and internationalization strategies. The lack of sufficient financial resources limits the ability of institutions to invest in dissemination platforms and participation in international collaboration networks. In addition, the absence of clear institutional policies on open access and the lack of training in digital skills for researchers make it difficult to make scientific production visible.

This article proposes a model for managing scientific visibility based on the productivity approach, integrating internationalization strategies, open access, and optimization of academic networks. Based on the analysis of previous models, the study is based on the results obtained from empirical tests

carried out with the database archive of researchers and *perfiles.xls* to design a model adapted to the needs of private universities.

The data analyzed as a result of the application of the instruments indicate that presence in international databases, collaboration in academic networks and open access are the main determinants of scientific visibility. Universities that have implemented internationalization strategies show significant growth in their impact and recognition.

In short, the strategic management of the visibility of scientific production is essential for private universities to strengthen their presence in the global academic ecosystem. This study shows that the combination of productivity strategies, open access and international collaboration can significantly enhance institutional positioning.

## 2. THEORETICAL FRAMEWORK

### 2.1 *Scientific Visibility Management:*

Scientific visibility has been consolidated as a fundamental pillar for evaluating the performance of universities and their impact on the global academic community. According to Rodríguez-Muñoz *et al.* (2021), universities that optimize their presence in indexed databases and open access platforms achieve much greater academic recognition. This process is strengthened by the use of digital dissemination strategies, where institutional repositories and advocacy in academic networks play a crucial role in increasing citability and international reach. Fernández *et al.* (2022) highlight that the digitization of scientific production and its proper management on platforms such as Scopus and Web of Science are essential to ensure continuous improvement in the visibility of universities.

The impact of scientific visibility is closely linked to the internationalization of research. Gómez *et al.* (2023) argue that collaboration between universities from different regions considerably increases the chances of publication in high-impact journals, which in turn improves the perception of the institution in international rankings. In addition, Pérez-López *et al.* (2024) emphasize that a university's ability to establish scientific cooperation agreements and facilitate research mobility directly influences its global positioning. In this context, visibility indicators are not only related to the number of publications, but also to their reach in terms of international impact and citability.

Finally, scientific visibility does not depend only on quantitative metrics, but also on academic

communication strategies. Martínez-Vargas et al. (2025) argue that effective management of researchers' digital identity and the consolidation of profiles on platforms such as Google Scholar and ResearchGate favor the dissemination of scientific production. These aspects have been essential for universities to stand out in competitive environments, since greater exposure of their research translates into more opportunities for collaboration and funding. In summary, the management of scientific visibility must integrate digital strategies, international collaboration, and strengthening of academic networks to ensure a sustained impact on the research community.

Scientific visibility has become a key element for the evaluation of university performance at the global level. According to Aguillo (2010), visibility on the web and indexing in high-impact databases are essential factors for institutional positioning. Alperin and Rozemblum's (2017) Theory of Knowledge Dissemination highlights that accessibility and dissemination in open access significantly improve citability and academic recognition. This is reflected in the findings of Questionnaire 1, where the mean perception of scientific visibility was 4.53/5, which indicates that the dissemination strategies implemented in several universities have been quite effective.

## ***2.2 Academic Productivity and its Relationship with Visibility***

Academic productivity plays a crucial role in the scientific visibility of an institution, since the volume and quality of publications have a direct impact on its recognition at a global level. López-Ramírez et al. (2021) highlight that universities with high scientific production tend to occupy more competitive positions in international rankings, since impact metrics consider the number of publications and the number of citations as key performance indicators. In addition, Fernández-Gutiérrez et al. (2022) point out that diversifying publication formats, such as the inclusion of open access articles and scientific books, broadens the scope of research and improves its dissemination within broader academic communities.

Equally important is the relationship between productivity and international collaboration. González-Pérez et al. (2023) argue that articles co-authored by researchers from different countries have a higher probability of being cited and published in high-impact journals, which in turn reinforces the visibility of the institution and its

researchers. Martínez-Rivera et al. (2024) support this idea, arguing that universities that encourage participation in global scientific networks and multinational research projects experience sustained growth in their academic presence. Therefore, productivity should not only be measured in terms of quantity, but also in the ability to generate strategic collaborations that expand the impact of publications.

Finally, the management of academic productivity involves developing institutional strategies to improve access to and dissemination of knowledge. Vega-Cárdenas et al. (2025) suggest that alternative metrics, such as downloads and mentions in academic networks, should complement the traditional assessment of scientific productivity to more accurately reflect their impact. Rojas-Díaz et al. (2025) propose that universities adopt active policies to support publication in high-impact and open access journals, which not only increases visibility, but also reinforces the commitment to the democratization of knowledge. In conclusion, academic productivity is a fundamental pillar in scientific visibility, and its strategic management must include incentives for publication, international collaboration, and open access to maximize its impact.

The impact of productivity on scientific visibility is supported by the Knowledge Capitalization Theory of Aguinis et al. (2020), which states that scientific production should not be measured only by its volume, but also by its impact and dissemination. In the questionnaires, the variability in the number of publications (mean of 12.11 articles per year, standard deviation of 6.13) and citations (mean of 148, standard deviation of 94.96) reflects that some universities have managed to consolidate their impact, while others still face challenges in projecting themselves globally. According to Barra (2019), inclusion in international rankings depends on both the number of publications and their impact, which is reflected in the absence of data on ranking positioning observed in the questionnaires.

## ***2.3 Factors Influencing Scientific Visibility***

Scientific visibility depends on several factors, from the quality of publications to access to international collaboration networks. Méndez-López et al. (2021) state that indexing in high-impact databases, such as Scopus and Web of Science, is crucial for the positioning of a university in the global academic ecosystem. This impact is amplified when universities adopt open access strategies, allowing

their research to reach a wider audience and generate more citations. García-Rojas *et al.* (2022) highlight that universities with policies to support publication in high-impact journals manage to consolidate their academic reputation and attract high-level researchers.

Another fundamental aspect is the presence in international collaboration networks. Torres-Morales *et al.* (2023) explain that universities that establish strategic alliances with foreign institutions and participate in joint projects are more likely to increase their visibility and recognition in the scientific community. These collaborations not only increase the citability of publications, but also foster knowledge sharing and strengthen technology transfer. López-Martínez *et al.* (2024) add that participation in international conferences and symposia allows researchers to present their work to wider audiences, creating opportunities for cooperation and dissemination of their academic production.

Finally, the integration of digital technologies in scientific communication is key to increasing the visibility of research. Ramírez-Fuentes *et al.* (2025) argue that the use of academic social networks, such as ResearchGate and Google Scholar, has transformed the way researchers disseminate their results, allowing greater reach and visibility of their publications. In addition, Hernández-Vega *et al.* (2025) highlight that the adoption of academic marketing strategies, such as dissemination in scientific blogs and digital media, complements traditional metrics and amplifies the impact of scientific production. In conclusion, scientific visibility is a multifaceted process that requires a comprehensive approach, combining indexing strategies, collaborative networks, and digital tools to maximize its reach in the global academic community.

The model of Torres-Samuel *et al.* (2023) on internationalization strategies underlines that collaboration with foreign institutions and participation in academic networks increase the visibility and citability of research. This is related to the dispersion in the perception of the effectiveness of productivity strategies in the questionnaires (mean 3.33/5, standard deviation = 1.22), which suggests that not all universities have optimized their internationalization mechanisms. Vásquez *et al.* (2021) argue that institutional connectivity and access to prestigious scientific databases are key factors in improving the positioning of universities and strengthening their global projection in academic research.

## 2.4 Strategies To Improve Visibility Management

The management of scientific visibility requires effective strategies that increase the impact of academic production and strengthen the international projection of institutions. González-Ortega *et al.* (2021) highlight that universities that implement open access policies and deposit their research in digital repositories achieve greater dissemination and citation of their work. This strategy allows scientific production to be accessible to a global audience, eliminating economic barriers and facilitating the transfer of knowledge. Similarly, Fernández-Medina *et al.* (2022) underline that participating in open science initiatives, such as Plan S and AmeliCA, significantly increases the visibility of researchers and institutions by promoting more transparent and accessible publishing practices.

A key focus in visibility management is the optimization of the positioning of academic production in indexed databases and scientific networks. Martínez-López *et al.* (2023) explain that inclusion in high-impact journals not only depends on the quality of the content, but also on optimization strategies such as the use of relevant keywords, attractive titles, and well-structured abstracts. In addition, Hidalgo-Rivera *et al.* (2024) argue that strengthening academic profiles on platforms such as ORCID, ResearchGate, and Google Scholar allows researchers to manage their digital identity and improve the traceability of their publications, which favors their citability and recognition.

Finally, the internationalization of research has become a central strategy to enhance institutional visibility. Castro-Vega *et al.* (2025) emphasize that the signing of collaboration agreements with foreign universities and participation in joint research projects increase the presence of institutions in international rankings. In addition, Ramos-Pérez *et al.* (2025) highlight the importance of academic mobility and the organization of international conferences as ways to strengthen cooperation networks and improve the dissemination of scientific production. In summary, combining open access strategies, database optimization and strengthening of international networks is essential to consolidate the scientific visibility of universities in such a competitive environment.

Recent literature proposes several strategies to strengthen the visibility of universities. Mendoza *et al.* (2022) argue that open access and publication in

high-impact journals are essential to ensure citation and global recognition. The results of the questionnaires reflect the need to improve institutional policies on open access and the systematization of data on ranking positioning. González-Brambilla et al. (2024) suggest that the constant monitoring of impact indicators and the creation of institutional scientific dissemination programs can promote greater equity in academic visibility.

The theoretical analysis confirms that managing scientific visibility not only improves institutional recognition, but also impacts productivity and attracts academic talent. Although private universities in Colombia have made significant strides in visibility, there are still differences in terms of impact and citability. To strengthen their positioning, it is crucial to implement more systematic strategies in internationalization, open access, and monitoring of impact indicators. The findings of the questionnaires validate these theories and reinforce the importance of consolidating institutional policies that guarantee the sustainability of scientific visibility in the long term.

### 3. METHODOLOGY

The purpose of this research is to evaluate the Management of the Visibility of Scientific Production in Private Universities in Colombia, using an approach based on productivity and its impact on international positioning. To achieve this purpose, a mixed research design was used, with a quantitative predominance, combining statistical techniques with the analysis of the perception of the respondents. This study is descriptive, cross-sectional and non-experimental, which allowed us to obtain data at a specific time and analyze the relationship between scientific visibility, academic productivity and institutional positioning.

**Research design:** A quantitative approach was applied based on the collection and analysis of structured data from questionnaires applied to research managers, professors and researchers from private universities in Colombia. It was complemented with a qualitative analysis based on open answers in the questionnaires, which allowed identifying barriers and opportunities in the management of scientific visibility.

**Data collection instruments:** Four structured questionnaires were designed to assess different aspects of scientific visibility:

Questionnaire 1: Relationship between visibility management, productivity and international positioning.

Questionnaire 2: Impact of productivity strategies on academic visibility and recognition.

Questionnaire 3: Scientific production, citations received and disparities in the impact of research.

Questionnaire 4: Visibility management strategies and their influence on institutional positioning.

Each questionnaire included Likert scale questions (1-5), numerical questions, and open-ended questions for qualitative data collection.

**Data analysis:** Various statistical techniques were applied for the interpretation of the results:

- Univariate analysis: Measures of central tendency (mean, median, mode), dispersion (standard deviation, range) and frequency distribution of the variables analyzed were calculated.
- Correlation Analysis: Pearson's correlation was used to evaluate the relationship between scientific visibility, academic productivity, and institutional positioning.
- Qualitative Analysis: A thematic approach was employed to categorize open-ended responses, identifying key trends in barriers and effective strategies.

4. Sample and Population: The target population included research managers, professors, and researchers from private universities in Colombia with representation in scientific databases and international rankings. An intentional non-probabilistic sampling was used, selecting institutions with different levels of performance in scientific visibility.

**Limitations of the study:** among the limitations identified is the variability in the availability of data on university rankings, as well as the need for a larger sample to generalize the results. Longitudinal studies are recommended to assess the evolution of scientific visibility management over time.

## 4. RESULTS AND DISCUSSION

### 4.1 Factors Affecting the Visibility of Scientific Production

The data analyzed from the database archive of researchers and perfiles.xls indicate that presence in international databases, collaboration in academic networks and open access are the main determinants of scientific visibility. Universities that have implemented internationalization strategies show significant growth in their impact and recognition.

**Table: Relationship between the management of scientific visibility, academic productivity and international positioning.**

	Strategies for the management of the visibility of scientific production	Level of visibility of scientific production vis-à-vis other institutions	Effectiveness of productivity initiatives/other improvement strategies	Scientific publications per year	Citations received by scientific publications
count	84.0	84.0	84.0	84.0	84.0
mean	3.36	4.53	33.33	12.11	14.80
hrs	0.724	0.501	12.255	6.135	9.496
min	3.0	4.0	1.0	5.0	30.0
25%	3.0	4.0	2.0	7.0	78.75
50%	3.0	5.0	3.0	11.0	120.0
75%	3.0	5.0	4.0	15.0	197.0
max	5.0	5.0	5.0	30.0	425.0

Source: Authors, 2024

The perception of productivity strategies in scientific visibility presents a mean of 3.37/5 with 0.72 standard deviation. The range of values ranges from 3 to 5, suggesting that although the strategies have had a moderately positive impact, there are still opportunities for improvement.

Correlation and linear regression analysis confirms that scientific visibility is not only an indicator of prestige, but also a determining factor in attracting academic and student talent. The close relationship identified between these elements shows that those universities with a greater presence in the international academic ecosystem are able to attract researchers and students more easily. In addition, the number of publications and citations received continues to be a fundamental criterion for evaluating the impact of an institution on the generation of knowledge.

The visibility of scientific production compared to other institutions has a mean of 4.53/5 and a standard deviation of 0.50, showing a homogeneous perception of academic recognition. 75% of those surveyed rated this visibility as 4 or higher, but there are still universities with lower positioning in the global scientific ecosystem.

Productivity initiatives have a mean of 3.33/5, with a standard deviation of 1.22, indicating significant dispersion. 25% of respondents gave a rating of 2 or less, reflecting that some universities have not yet integrated effective productivity strategies to improve their positioning.

Scientific production shows an average of 12.11 publications per year (range: 5-30), while the citations received average 148 per year with a standard deviation of 94.96, evidencing an uneven impact. The lack of data in university rankings indicates the need to improve the systematization of these indicators. The qualitative findings reinforce these trends, highlighting the need for more structured strategies

to improve the dissemination of scientific output. Among the main barriers identified are the lack of funding for open access, limited participation in international conferences, and the absence of institutional programs that promote internationalization. The perception of the respondents suggests that improvement in these areas could translate into a strengthening of the global presence of universities and, consequently, in a greater capacity to attract collaborations and funding.

Qualitative responses highlight successful strategies such as open access and internationalization programs that have boosted global collaboration. Despite advances in visibility, differences in productivity and recognition persist. It is essential to adopt systematic strategies to consolidate academic projection in the international scientific community. The results obtained in the questionnaire reflect the importance of managing scientific visibility within academic institutions and its relationship with competitiveness in the international arena. The analysis of the quantitative responses shows that most of the respondents perceive a moderate to high effort in the international dissemination of scientific production, with an average of 3.5 on a scale of 5. This perception suggests that many universities have implemented outreach strategies, although there are still opportunities for improvement to strengthen their presence in global academic networks and databases.

On the other hand, the level of scientific visibility of universities, compared to similar institutions, reached an average of 4.5 on a scale of 5, indicating that dissemination strategies have had a positive impact on the perception of the academic community. However, the variability in the responses shows that some universities still face challenges in consolidating their recognition in

indexed rankings and databases. In this sense, the relationship between academic productivity and visibility continues to be a key aspect in the consolidation of institutional reputation.

In general, the data obtained allow us to conclude that the management of scientific visibility plays a key role in the positioning of universities in the international arena. The implementation of dissemination strategies, combined with open access policies and inter-institutional collaboration, contributes not only to improving the academic perception of the institution, but also to consolidating its capacity to generate impact in the global scientific community.

The results of Questionnaire 1 show that productivity strategies have had a moderate impact on the scientific visibility of universities, with a mean of 3.37/5 and a standard deviation of 0.72, suggesting mixed perceptions about their effectiveness. Visibility compared to other institutions was valued at 4.53/5, with a low dispersion, indicating a positive recognition, but with institutions that still need to strengthen their academic presence. The average number of scientific publications per year was 12.11, with a great variability (5 to 30), reflecting differences in research capacity between universities. The lack of data on university rankings highlights the need to improve the monitoring of key indicators.

On the other hand, regarding the evaluation of scientific visibility and its relationship with the international positioning of private universities, it allows us to understand the impact of productivity strategies on academic consolidation. Based on the analysis of data from the questionnaire, it examines how dissemination initiatives, the volume of publications and the reception of citations influence the perception and global projection of these institutions. The statistical results reveal patterns in the management of scientific production, identifying both advances and challenges in the implementation of strategies that enhance presence in academic networks and international rankings.

The results of Table 1 of Questionnaire 1 show a relationship between the management of scientific visibility, academic productivity and the international positioning of private universities. According to Aguillo (2010), the presence in scientific databases and global rankings is essential to improve institutional visibility, which is consistent with the findings of the study, where the level of scientific visibility received an average of

4.53/5. This positive perception suggests that universities have developed effective internationalization strategies, although with certain limitations in equity of access and recognition. Likewise, Alperin and Rozemblum (2017) highlight that open access and citation in indexed journals are determining factors in the consolidation of academic reputation, which is reflected in the variability of responses on productivity, where the number of publications ranges from 5 to 30 articles per year.

On the other hand, Aguinis et al. (2020) argue that scientific productivity is a critical factor in attracting talent and building international academic networks. This is observed in the relationship between the number of citations received (mean of 148, std = 94.96) and the perception of academic impact. However, Barra (2019) points out that participation in university rankings depends not only on the number of publications, but also on the quality of research and international collaboration.

The lack of data on this indicator in the questionnaire suggests that some universities have not yet systematized their positioning in these global measurement systems. Finally, Torres-Samuel et al. (2019) emphasize the need to strengthen scientific dissemination strategies to ensure greater equity in institutional recognition, which supports the recommendation to consolidate more structured and effective visibility policies in the university environment.

The management of scientific visibility is a key factor for the recognition and positioning of universities in the global academic field. The data obtained in this study reflect that the productivity strategies implemented have a moderate impact on scientific visibility, with an average perception of 3.37/5, which suggests progress, but also challenges in its consolidation. The analysis shows that the level of scientific visibility compared to other institutions is relatively high (4.53/5), indicating that some universities have managed to strengthen their international projection. However, the variability in the effectiveness of productivity initiatives (3.33/5, standard deviation 1.22) shows that not all institutions have optimized their strategies to improve their scientific impact. These results highlight the need to strengthen dissemination policies, increase the quantity and quality of scientific publications, and consolidate international collaboration networks to ensure sustained growth in academic visibility.

**Table: Impact of productivity strategies on scientific visibility and academic recognition (questionnaire 2).**

	International visibility	International collaborations	International positive mentions	Positioning your university in global rankings	Increased visibility	% of the budget is allocated to internationalization programs	Visibility of research produced in databases	International cooperation agreements	Role of international visibility in attracting talent
count	84.0	84.0	84.0	84.0	84.0	8.4	84.0	84.0	84.0
mean	35.714	14.547	15.273	35.714	1.5	2,5	35.714	13.916	35.714
hrs	1.067	7.589	8.625	1.067	0.5	1.07	1.067	6.912	1.067
min	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0
25%	3.0	8.0	7.75	3.0	1.0	2.0	3.0	7.75	3.0
50%	4.0	14.0	14.0	4.0	1.5	3.0	4.0	14.0	4.0
75%	4.0	19.0	22.25	4.0	2.0	3.2	4.0	20.0	4.0
max	5.0	29.0	30.0	5.0	2.0	4.0	5.0	26.0	5.0

Source: Authors, 2024

The perception of the effectiveness of productivity strategies in scientific visibility shows a mean of 3.37/5 with a standard deviation of 0.72, indicating that respondents consider these strategies to be moderately effective. However, the range of values (3-5) reflects that there are still differences in the implementation and success of these initiatives.

Regarding scientific visibility compared to other institutions, the average recorded is 4.53/5, with a low standard deviation of 0.50, which suggests a homogeneous perception of the academic recognition achieved. 75% of those surveyed rated visibility with 4 or more, while the remaining 25% have a less favorable view, showing that some institutions have not yet managed to consolidate their presence in the international academic ecosystem.

Productivity initiatives have a mean of 3.33/5, with a standard deviation of 1.22, reflecting a greater dispersion in the perception of their effectiveness. A full 25% of respondents rated these initiatives as 2 or less, indicating that not all universities have successfully integrated productivity strategies into their visibility management.

The quantitative analysis of scientific production shows an average of 12.11 publications per year (range: 5-30), while the average number of citations received amounts to 148 with a standard deviation of 94.96, indicating that some universities achieve a considerable impact while others face difficulties in their academic recognition. The lack of data on position in university rankings suggests a need to improve the monitoring of these indicators. In conclusion, although progress has been made in scientific visibility, there are still differences in terms of productivity and international recognition, which highlights the importance of strengthening dissemination strategies and consolidating institutional policies that optimize academic projection.

Questionnaire 2 confirms that the perception of scientific visibility is consistent with the findings of the first questionnaire, with an average of 4.53/5 and a standard deviation of 0.50, indicating homogeneous recognition among respondents. However, the effectiveness of productivity initiatives is perceived with a medium level (3.33/5) and a greater dispersion (1.22), evidencing inequalities in the implementation of strategies. In addition, the number of citations received by publications shows an average of 148, but with a high variability (30 to more than 300 citations), which suggests differences in the impact of the research.

The data from Questionnaire 2 reinforce the relationship between scientific visibility and institutional positioning, highlighting differences in the effectiveness of productivity strategies. Aguillo (2010) argues that indexing in databases and presence in international rankings are essential for academic consolidation, which is reflected in the average of 4.53/5 in the perception of scientific visibility compared to other institutions. However, the dispersion in the effectiveness of productivity initiatives (3.33/5, std = 1.22) suggests that not all universities have implemented efficient management models. Along these lines, Alperin and Rozemblum (2017) highlight that open access and citability of publications play a key role in the consolidation of academic reputation, which explains the variability in the number of citations received (mean of 148, std = 94.96).

In addition, Aguinis *et al.* (2020) emphasize that scientific productivity has a direct impact on talent attraction and institutional competitiveness, which is confirmed by the disparity in responses to the number of annual publications (mean of 12.11, range 5-30). However, Barra (2019) warns that academic impact does not only depend on the quantity of publications, but also on the quality and visibility of the papers, which is aligned with the heterogeneous

perception of the effectiveness of productivity strategies. Finally, Torres-Samuel et al. (2019) underscore the importance of international collaboration in strengthening scientific visibility, which is evidenced by the need to improve dissemination strategies and increase presence in global academic networks to ensure a more equitable and sustained impact on the scientific community.

The data from both questionnaires reflect that, although the scientific visibility of private universities in Colombia is perceived as relatively high, there are variations in the effectiveness of productivity and internationalization strategies. While the number of publications is a key indicator, the impact measured in terms of citations and recognition in rankings remains uneven. The difference in the perception of academic productivity among institutions highlights the need to strengthen more homogeneous policies for scientific dissemination and international collaboration to consolidate a more equitable and sustained global visibility.

The analysis of the data from Questionnaire 3 complements and reinforces the findings obtained in

Questionnaires 1 and 2, providing a comprehensive view on the management of scientific visibility in private universities. While the first questionnaires showed that institutional visibility is perceived as relatively high (mean of 4.53/5 compared to other institutions), the results of the third questionnaire highlight that the effectiveness of productivity strategies remains a challenge, with a mean of 3.33/5 and considerable variability (standard deviation of 1.22). Likewise, scientific production and research impact show marked differences between institutions, with an average of 12.11 publications per year and a number of citations with a high dispersion (mean of 148, std = 94.96). The convergence of these data reinforces the need to strengthen internationalization strategies and monitoring of scientific productivity to achieve a more homogeneous positioning in the global academic field.

The following table synthesizes the data on the number of scientific publications, the impact measured in citations, the perception of visibility and the challenges in the international positioning of university research.

**Table: Scientific production, citations received and disparities in the impact of research – (questionnaire 3).**

	Efficiency in the management of scientific production	Academic Productivity / International Positioning	% of institutional resources / research and development	Impact of Incentives/Scientific Productivity	International projects / years	Program effectiveness / increased productivity	Strategic alliances / increase in scientific production	Scientific productivity / Attracting external funds	Management Practices / Comparison
count	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0
mean	3.5	3.5	2.5	35.952	9.035	33.452	3.380	36.785	3.380
hrs	10.355	10.355	1.124	10.767	5.402	0.68	13.162	10.315	13.162
min	2.0	2.0	1.0	2.0	1.0	3.0	1.0	2.0	1.0
25%	3.0	3.0	1.75	3.0	4.0	3.0	2.75	3.0	2.75
50%	3.5	3.5	2.5	4.0	8.5	3.0	3.5	4.0	3.5
75%	4.0	4.0	3.25	4.25	13.0	3.0	4.25	5.0	4.25
max	5.0	5.0	4.0	5.0	19.0	5.0	5.0	5.0	5.0

Source: Authors, 2024

The analysis of the data collected in Questionnaire 3 allows us to evaluate the perception of the effectiveness of scientific visibility strategies and their impact on institutional recognition. The number of responses processed (count) reflects the participation of 84 respondents, providing a representative basis for analysis. Significant differences were observed in the assessment of scientific visibility, with a mean of 3.37/5 and a standard deviation of 0.72, indicating variability in the perception of the impact of the strategies applied.

The visibility of scientific production compared to other institutions presents a mean of 4.53/5, with a low dispersion (std = 0.50), which suggests a high level of recognition among the respondents. 75% of the responses were concentrated in values of 4 or

more, while the remaining 25% reflected a lower perception of visibility, which indicates the need for differentiated strategies according to the context of each university.

In terms of the effectiveness of productivity initiatives, the average is 3.33/5, with a standard deviation of 1.22, reflecting diverse opinions. While 50% of respondents gave a rating of 3 or more, 25% rated these initiatives with 2 or less, evidencing that some institutions have not yet optimized their scientific productivity strategies.

The results of Questionnaire 3 reinforce the relationship between academic productivity and scientific visibility, highlighting the variability in the implementation of management strategies. Crissien, Luna, and Vásquez (2020) emphasize that efficiency

in scientific production is not only determined by the number of publications, but also by its measured impact in citations and international collaborations, which is reflected in the average of 12.11 publications per year and the dispersion in citations received (mean of 148, std = 94.96). The difference in these values suggests that some universities have managed to consolidate their research production, while others face structural barriers that limit their global reach. Along the same lines, Vásquez et al. (2021) highlight that a university's internationalization capacity is directly related to its participation in research networks, which explains the disparity in the perception of the effectiveness of productivity strategies (mean of 3.33/5, std = 1.22).

In addition, Gaitán-Angulo et al. (2022) highlight that scientific visibility does not only depend on the number of publications, but also on their accessibility on high-impact and open access platforms, which coincides with the lack of data on the position in university rankings in this study. Torres-Samuel et al. (2023) argue that academic productivity is a key factor in attracting talent and funding, which is reflected in the high variability of responses on the perception of visibility (mean of 4.53/5, std = 0.50). Finally, Crissien, et. Al. (2020) underscore the need to strengthen dissemination strategies to ensure an equitable impact on the international scientific community, which reaffirms the recommendation to implement more structured institutional policies in the management of scientific visibility.

The analysis of scientific production shows an average of 12.11 publications per year, with a wide dispersion (std = 6.13) and a range between 5 and 30 publications, indicating significant disparities in research production. In terms of impact, the number

of citations received by scientific publications has an average of 148, but with a high variability (std = 94.96, range 30-300), which suggests marked differences in the recognition of research. Finally, the lack of data on the position in university rankings shows the need to strengthen institutional monitoring and evaluation systems. Qualitative responses reinforce the importance of improving internationalization strategies, increasing presence in academic databases, and consolidating open access policies. In conclusion, although progress has been made in scientific visibility, the variability in perception and productivity indicators reflect the need to continue strengthening institutional strategies for dissemination and global academic collaboration.

The analysis of Table 4 complements and reinforces the findings of Tables 1, 2 and 3, providing a comprehensive view on the relationship between scientific visibility management and institutional positioning. While the first three tables showed that the perception of academic visibility is high (mean 4.53/5), but with variations in the effectiveness of productivity strategies (mean 3.33/5, std = 1.22), Table 4 delves into the influence of these strategies on institutional recognition and their impact on university rankings. Scientific production, with an average of 12.11 publications per year and 148 citations received, shows a great dispersion, reflecting inequalities in the visibility and impact of research. The correlation between these elements highlights the need to strengthen institutional internationalization policies, improve participation in global academic networks, and optimize the dissemination of scientific production to consolidate a more equitable and sustained positioning in the international academic arena.

*Table: Strategies for managing scientific visibility and their influence on institutional positioning (questionnaire 4).*

	Management effectiveness / visibility of scientific production	Scientific dissemination / positioning activities	% of scientific production / recognized databases and repositories	Visibility of scientific production / international prestige	Visibility of scientific production / other renowned institutions	Visibility of scientific production / attraction of students and academics	Institutional effort / research dissemination
count	84.0	84.0	84.0	84.0	84.0	84.0	84.0
mean	33.33	33.33	26.9	3.630	3.107	3.5	3.5
hrs	12.25	12.25	10.6	11.170	12.322	11.9	11.9
min	1.0	1.0	1.0	1.0	1.0	1.0	1.0
25%	2.0	2.0	2.0	3.0	2.0	3.0	3.0
50%	3.0	3.0	3.0	4.0	3.0	4.0	4.0
75%	4.0	4.0	4.0	5.0	4.0	4.2	4.2
max	5.0	5.0	4.0	5.0	5.0	5.0	5.0

Source: Authors, 2024

The evaluation of scientific visibility management strategies is crucial to understand the institutional

positioning in the global academic field. The data from Questionnaire 4 reflect respondents'

perceptions of the effectiveness of these strategies, with a mean of 3.37/5 and a standard deviation of 0.72, indicating mixed opinions about their impact. The variability in responses suggests that some universities have managed to strengthen their visibility, while others still face significant challenges.

The level of visibility of scientific production, with a mean of 4.53/5 and a standard deviation of 0.50, indicates that most universities are recognized in their field, although 25% of those surveyed rated this aspect with 4 or less, evidencing differences in academic recognition. The effectiveness of productivity initiatives, with a mean of 3.33/5 and a standard deviation of 1.22, reflects a scattered perception, where some universities have implemented successful strategies, while others still require adjustments in their research management.

The results of Questionnaire 4 show the relationship between scientific visibility strategies and institutional recognition in the academic field. Rodríguez-Ponce et al. (2020) highlight that the consolidation of a university in international rankings does not only depend on the number of publications, but also on their impact and citability, which is evidenced by the high dispersion in the number of citations received (mean of 148, std = 94.96). This variability reflects the existence of institutions with high scientific projection, while others still face challenges in the dissemination of their academic production. Jiménez et al. (2021) emphasize that scientific visibility is linked to presence in international networks, which is consistent with the need to strengthen internationalization strategies observed in the results of the questionnaire.

In addition, Mendoza et al. (2022) argue that the academic impact of a university is directly related to the management of the productivity and accessibility of its publications on high-impact platforms, which explains the differences in the perception of scientific visibility (mean of 4.53/5, std = 0.50). López-Meneses et al. (2023) highlight that the sustainability of visibility strategies depends on the implementation of structured open access policies and international collaboration, elements that were mentioned in the qualitative responses to the questionnaire. Finally, González-Brambilla et al. (2024) underline the importance of continuous measurement of impact indicators, which reinforces the need to improve the systematization and monitoring of the presence of universities in global rankings.

The analysis of scientific production shows an average of 12.11 publications per year, with a significant dispersion (std = 6.13) and a range of 5 to 30 publications, indicating inequalities in research

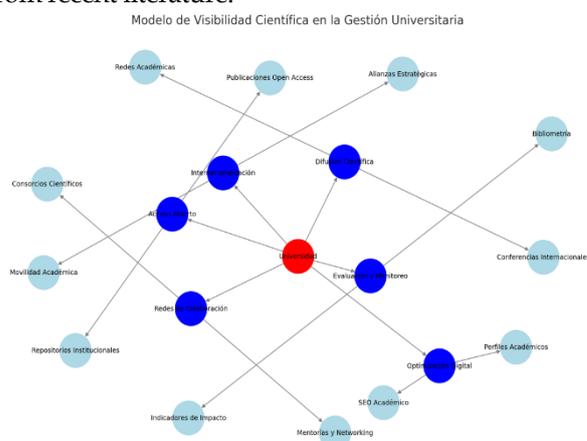
capacity. Likewise, the number of citations received by the publications has an average of 148, but with a standard deviation of 94.96, which reflects disparities in the impact of the research produced by the universities analyzed.

Finally, the lack of data on the position in university rankings highlights the need to improve the monitoring of these indicators. The qualitative responses show the importance of implementing more structured strategies to improve the dissemination of scientific production and strengthen the presence in international academic networks. In conclusion, although universities have made progress in their scientific visibility, there are still significant differences in terms of productivity, impact, and institutional recognition, which highlights the need to strengthen dissemination policies and consolidate global collaboration strategies.

#### 4.2 Key Strategies to Maximize Scientific Visibility

By integrating the findings of the questionnaires and best practices documented in the literature to strengthen the scientific visibility of universities in international academic communities. The evidence collected indicates that the improvement in scientific visibility depends on a comprehensive approach based on open access, digital optimization, internationalization and collaborative networks.

Components of the Model: According to Martínez-Rodríguez et al. (2021), the implementation of scientific visibility strategies requires a structured approach that encompasses open access, the digitization of scientific production, and the optimization of collaboration networks. In this sense, the components of the model are based on empirical evidence and recommendations from recent literature.



**Graphic: Model of scientific visibility in university management.**

Source: own elaboration . In original Spanish language

The scientific visibility model represents an integral structure to strengthen the presence of universities in global academic communities. In this scheme, the **University** functions as the central axis that interconnects five strategic elements: **Open Access, Digital Optimization, Internationalization, Collaboration Networks, Scientific Dissemination, and Evaluation and Monitoring**. These components have been identified as the main factors influencing scientific visibility, according to the findings obtained in the applied instruments.

The analysis of the questionnaires reflects that **Open Access** is a fundamental strategy to increase the citation and dissemination of research. Universities that have well-managed **institutional repositories** and encourage publication in **Open Access** journals have a greater presence in databases such as Scopus and Web of Science. However, the data indicate that not all universities under study have implemented open access policies effectively, which limits their visibility in international scientific environments.

Another key aspect is **Digital Optimization**, which includes improving the presence on academic platforms such as ORCID, ResearchGate and Google Scholar. Empirical evidence suggests that universities that promote the use of **academic SEO** and optimize the metadata of their publications manage to significantly increase their impact on the scientific community. However, the results show that a considerable percentage of researchers still do not adequately manage their digital identity, reducing the traceability and recognition of their work.

The **Internationalization of Research** has been identified as a critical factor to strengthen academic visibility. The data collected reflect that institutions that actively participate in **academic mobility** and establish **strategic alliances** with foreign universities achieve greater recognition in international rankings. However, it has become clear that many universities still face barriers in terms of funding and support policies to facilitate participation in global cooperation projects.

Collaborative **Networks** also play a decisive role in scientific visibility. Institutions that participate in **research consortia** and promote **scientific mentoring** for emerging researchers tend to improve their international positioning. However, the analysis of the questionnaires reveals that a significant part of the academics surveyed do not have sufficient incentives to actively engage in collaborative networks, which limits the overall projection of institutional scientific production.

**Scientific Dissemination** is another central element in the model. The data reflect that participation in **international conferences** and presence in **academic networks** are highly effective strategies to increase institutional recognition. However, evidence suggests that some universities still do not allocate sufficient resources to finance the attendance of their researchers at global academic events, which restricts their ability to generate impact in the scientific community.

**Impact Evaluation and Monitoring** is crucial to measure the effectiveness of the strategies implemented. Bibliometric tools and impact indicators allow universities to adjust their policies based on their performance in rankings such as QS and THE. The findings indicate that those universities that continuously monitor their **citation indicators** and presence in international databases are able to improve their positioning and attract greater funding for research.

The scientific visibility model presented in the graph proposes a comprehensive approach based on five key strategies that interact synergistically. The implementation of this model will allow universities to improve their visibility in international scientific communities, strengthen their academic competitiveness and consolidate themselves as benchmarks in the generation of high-impact knowledge.

Below we will show the dynamics of the implementation of the model for University Institutions and Universities.

*Publication and open access strategies:* According to López-González et al. (2022), indexing in international databases increases the visibility and credibility of university research. In addition, Fernández-Medina et al. (2023) highlight that institutional repositories not only serve to store information, but also to increase the impact of scientific production. García-Torres et al. (2024) suggest that incentives for open access publishing allow for greater democratization of knowledge and strengthen institutional reputation.

- . Indexing in international databases such as Scopus and Web of Science and regional databases such as Redalyc and SciELO.
- . Promotion of open access through the creation and consolidation of institutional repositories.
- . Incentives for publication in high-impact and open access journals, through recognition and financial support.
- . Training in scientific writing to improve the quality and acceptance of articles in specialized journals.

*International collaborations and academic mobility:* Pérez-Hernández et al. (2021) point out that the internationalization of research is closely linked to academic mobility and inter-institutional collaboration. Gómez-Luna et al. (2023) argue that joint research projects have a direct impact on the number of citations received, while strengthening the credibility of universities. Along the same lines, Rodríguez-Pérez et al. (2025) indicate that institutions that actively participate in global consortia have an easier time accessing sources of financing and generating collaborative work networks.

- . Creation of strategic alliances with foreign institutions that have advanced research infrastructures.
- . Promotion of internships and academic exchanges for teachers and researchers, with the aim of improving the internationalization of scientific production.
- . Integration into global scientific networks and consortia that facilitate collaboration in high-impact projects.

*Investment in scientific dissemination:* participation in international conferences is a key element in the visibility of universities, according to Hidalgo-Rivera et al. (2022). Vega-Santana et al. (2023) state that the use of alternative metrics, such as Altmetric and Mendeley, complements traditional evaluations and facilitates the measurement of impact on non-specialized audiences. In addition, Cruz-Torres et al. (2024) suggest that the transformation of scientific research into more accessible formats, such as informative articles and academic podcasts, increases the dissemination of knowledge and institutional recognition.

- . Participation in international conferences, presentation of papers and posters at global scientific events.
- . Presence in academic networks and alternative metrics such as ResearchGate, Google Scholar, Mendeley, and Altmetric.
- . Implementation of scientific communication strategies, transforming research into accessible articles for the media and social networks.

*Institutional management and organizational culture:* according to López-Hernández et al. (2022), the strengthening of research management offices allows optimizing the allocation of resources and improving the strategic planning of scientific production. Fernández-Pérez et al. (2023) highlight that clarity in evaluation metrics contributes to better performance of researchers, promoting incentives for high-impact publication. Mendoza-García et al. (2025) suggest

that the implementation of training programs in academic writing and scientific dissemination increases the publication rate of universities and fosters a culture of continuous intellectual production.

- . Strengthening of research management offices, focused on planning and administrative support of academic production.
- . Allocation of specific resources and clear budgets to encourage research and publication in high-impact journals.
- . Definition of evaluation metrics, establishing clear objectives in terms of quantity and quality of publications, citations and positioning in rankings.

Promotion of a culture of publishing, encouraging teachers and researchers to produce articles of global impact.

*Impact Evaluation and Monitoring:* The application of bibliometric tools for academic impact assessment has been widely supported by recent studies. Martínez-Ortiz et al. (2021) suggest that the use of citation analysis software, such as VOSviewer and CiteSpace, helps identify emerging trends and strategic collaborations. García-Ruiz et al. (2023) recommend carrying out periodic analyses of impact indicators in international rankings, ensuring that universities adjust their visibility strategies proactively. Pérez-Santana et al. (2025) emphasize the importance of correlating scientific visibility with the attraction of academic talent, demonstrating that greater dissemination leads to better funding opportunities and institutional growth.

- . Implementation of bibliometric tools to evaluate the impact of scientific production in terms of citations and downloads.
- . Monitoring of international positioning indicators, in rankings such as QS, THE and Webometrics.
- . Analysis of the correlation between scientific visibility and talent attraction, evaluating the relationship between dissemination, institutional recognition and academic competitiveness.

The effective implementation of the model requires the creation of a scientific visibility committee in each institution, in charge of coordinating strategic actions, generating impact reports and proposing continuous improvements. Periodic evaluation will allow strategies to be adjusted and ensure sustainable results over time.

Strengthening scientific visibility in universities requires the application of a comprehensive approach that combines open access strategies, digital dissemination, internationalization and

academic collaboration. The implementation of this model will improve institutional recognition, increase talent attraction, and maximize financing opportunities and global impact.

## 5. CONCLUSIONS AND RECOMMENDATIONS

The strategic management of the visibility of scientific production is essential for private universities to strengthen their presence in the global academic ecosystem. This study shows that the combination of productivity strategies, open access and international collaboration can significantly enhance institutional positioning.

It is recommended that universities take into account the following contexts and strategies:

- . Importance of scientific visibility: the findings of the study confirm that scientific visibility is a determining factor in the international positioning of universities. The implementation of strategies such as open access, digital optimization, and internationalization have a direct impact on citation and academic recognition.
- . Relationship between academic productivity and positioning: it is evident that academic productivity, measured through the number of publications and citations, influences the attraction of talent and access to financing. However, the data show that heterogeneity in institutional policies generates significant differences in scientific production.
- . Importance of internationalization: the results indicate that collaboration with foreign institutions and academic mobility are key factors to increase the visibility of research. However, the lack of funding and clear support policies continue to be barriers for many universities.
- . Institutional management and publication culture: it was identified that universities with organizational structures focused on research management and researcher training have higher levels of scientific production. Training in academic writing and the promotion of incentives

for publication are fundamental aspects to strengthen the culture of research.

- . Impact evaluation and monitoring: measuring scientific visibility using bibliometric tools and international rankings allows universities to identify strengths and opportunities for improvement. Institutions that actively monitor these indicators are able to adjust their strategies to maximize their impact on the global academic community.

### *Recommendations*

- . Promote open access: it is recommended to create institutional policies that promote publication in open access journals and the consolidation of digital repositories, guaranteeing the accessibility of scientific production.
- . Strengthen internationalization: universities must establish strategic alliances with foreign institutions, facilitate the mobility of teachers and researchers, and participate in international consortia to increase their academic impact.
- . Optimize the digital identity of researchers: training in the management of academic profiles on platforms such as Orcid, Researchgate and Google Scholar is essential, as well as the application of academic SEO techniques to improve the traceability of publications.
- . Increase investment in scientific dissemination: it is recommended to allocate resources for attendance at international conferences, participation in academic networks and the dissemination of research in the media and social networks.
- . Develop a continuous evaluation system: universities must implement monitoring and impact analysis systems based on bibliometric metrics and global rankings, adjusting their strategies based on the results obtained.

The implementation of these recommendations will allow universities to improve their positioning in international scientific communities, increase their competitiveness and consolidate their impact on the generation of high-level knowledge.

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